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SHORT STUDIES ABROAD—THE SEVEN HILLS OF ROME

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A FIVE-MINUTE DESCRIPTION OF THE SEVEN HILLS. A subdued range of deformed limestones, constituting a strong member of the Apennines in central Italy, was once bordered on the southwest by a shallow sea bottom—or by a lowland slightly elevated above sea level—on which four great volcanoes, each some 20 or 25 miles in diameter, were piled up in a complicated succession of lava flows and ash beds, forming cones of gentle slope. All of them seem to have suffered a more or less complete engulfment of their higher parts, for such appears to have been the origin of the large calderas, holding lakes in three of the volcanoes, and of the imperfect caldera in the fourth or southeastern member of the series (Fig. 1.) All have suffered submature dissection by consequent streams, so that their gentle slopes are no longer so smooth as they must have been at the time of full growth, but are radially furrowed by shallow valleys. The volcanoes at present are not conspicuous mountains, and are not designated by separate single names, although many local names are applied to minor features. We may call them, beginning on the northwest, the Bolsena, Vico, Bracciano and Albano volcanoes, the first three names being those of the lakes in the calderas; the last being the singular form of the name, Monti Albani, that is applied to the group of summits which now replaces the presumably single original cone of the fourth volcano.

The rivers of the interior, which formerly flowed unhindered from the Apennines to the sea, were obstructed by the broad cones; hence their waters were constrained to gather in the longitudinal depression between the limestone mountains and the row of volcanoes, probably for a time forming a lake which rose to seek the lowest possible point of escape. It happened that the lowest outlet was found between the third and fourth volcanoes, probably because they are farthest apart. There the gathered waters, forming a good sized consequent river, which we may now call the Tiber, crossed the broad and flat saddle between the long volcanic slopes, eroded a valley in it, and so reached the sea, then some eight miles from the saddle, where it proceeded to build a cuspate delta, by which it has now added over nine miles to its length. The

consequent valley is deepened some 150 feet, below the level of the saddle, and its floor is widened to about the breadth of the meander belt developed by the Tiber, roughly a mile and a quarter. The consequent streams of the volcanic slopes on either side were at work at the same time, maturely eroding the somewhat irregular radial valleys above mentioned, and wearing them down to grade with the Tiber valley floor. Between the radial valleys many even-topped spurs, composed largely of volcanic ashes or tuff, now advance to the border of the main valley, where

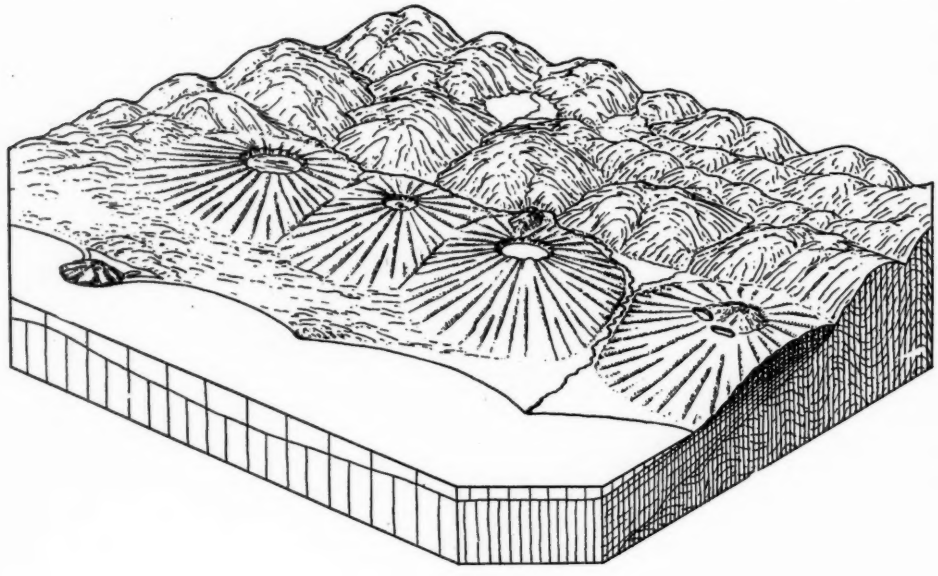

FIGURE 1

the spur ends are frayed out and cut into hills by the work of numerous small wet-weather streams. There are some 20 or 30 such hills along the two sides of the main valley near the saddle crest, according to the large-scale Italian maps. They are all much alike in constitution and form, but some are lower than the others, from being consumed by the widening of their adjoining valleys: the larger ones still rise nearly or quite to the general height of the broad saddle in which the two long volcanic slopes formerly united. A small group of these hills south of the Tiber, not otherwise distinguished from their fellows, form the site of the Eternal City; and these have become famous as the Seven Hills of Rome.

LOCAL DETAILS. Any one of the higher spur-ends on the north or right side of the Tiber valley affords a good general view of the city and the district. Monte Mario, (460 feet) about a mile and a quarter north of St. Peters, is higher than its neighbors. If one looks from this hill up and across the valley to the northeast and east, the rounded limestone

mountains in the front range of the Apennines are seen, over eighteen miles distant; they are mostly bare of trees and the higher slopes are largely stripped of soil, this desolate condition probably being the result of reckless deforesting in ancient time and of persistent browsing by goats and sheep ever since. To the southwest and west glimpses of the low delta plain may be had, and of the sea also; still better if one ascends farther northward by the Via Cassia on the slopes towards Bracciano. Across the Tiber valley to the south and southeast, rise the corresponding slopes of the Alban mountains, their lower part being known as the Campagna, traversed by several acqueducts and by the Appian Way with its ruins. One of the towns visible on the Alban slope above the Campagna is Frascati, eleven miles southeast of Rome, and on a hill-spur near this town are the ruins of ancient Tusculum.

Rome was first built on a few of the hills on the south side of the Tiber valley, at a time when hill-sites were chosen as aids in defense. It then spread over other neighboring hills, and now occupies more than seven of them, as well as part of the valley floor on both sides of the river. Different hills have been grouped as the classic seven by different authors at different times. No ground for stopping at seven is found in the topography; the reason for it may be connected with some ancient superstition regarding this number. The part of the city on the right bank is known as Trastevere, or Across the Tiber. St. Peters is in this part. A short distance back of the great cathedral are several brickyards where the pre-volcanic clays are laid bare, underneath the tuff hills of the Bracciano slope.

Railroads to and from Rome. The railroads centering in Rome are related to the volcanoes in an interesting manner. The line from Genoa follows near the coast outside of the three northwestern cones; their long slopes are frequently seen, but the coastal landscape is somewhat complicated by the occurrence of hills of earlier origin. Among these is Monte Argentario, formerly an island, but now united to the mainland by symmetrical sand-reefs or *tomboli*, thus offering one of the finest examples of island-tying. The town of Orbetello borders the enclosed lagoon back of the island. The railroad crosses the Tiber, sweeps around the southern side of Rome, and then enters the city northwestward to the main station. It is well to remember this, especially if one arrives at night; otherwise a wrong prepossession as to the points of the compass may cause trouble in finding one's way about.

The railroad from Rome to Florence runs up the floor of the Tiber valley 25 miles north-northeast to the limestone mountains, and then north-northwest along their base about sixty miles farther. The mountains are well seen as they are approached. An outlying mass of limestone, culminating in Monte Soratte, rises in the northeastern slope of Bracciano; the Tiber runs behind it and isolates it from its fellows, as if the river had

here been turned across a gap back of Soratte, because the slope of Bracciano rose so high in front of it. The first transverse valley in the limestone range lies northeast of Vico; it gives outlet to a stream, the Nera, which drains two flat-floored intermont basins, of the kind so frequently seen among the Apennines; basins, because of geologically modern deformation; and flat-floored, because of being aggraded with inwashed gravels, sands and clays. A branch railroad, with Ancona on the Adriatic coast for its goal, ascends the transverse valley to the first intermont basin, of which the chief town is Terni: it then crosses a low divide and descends to the northeast into another and larger intermont basin, occupied by the beautiful Umbrian plain, with Assizi on the slope of the subdued mountains on the east, and Perugia far to the northwest.

Where the Nera leaves the Terni basin and enters the steep-walled transverse valley in the limestone range stands the village of Narni, and near by are the remains of a superb Roman bridge of high arches, one of the most dignified monuments of ancient Italy. The Nera probably continued in an independent course to the sea before the volcanoes were built; but it is now taken in by the south-flowing Tiber. To the west, in the saddle between Vico and Bolsena lies the town of Viterbo. Farther north-northwest, up the Tiber valley in the depression between the Apennines and the volcanoes, another transverse valley is reached, again draining flat-floored intermont basins; and as this valley gives outlet to the longest member of the Tiber system, the river's name is here extended to its head in the mountain valleys northeast of Perugia. The railroad now leaves the Tiber and continues its way up the depression, here drained by the Paglia; it passes a spur at the northeastern base of Bolsena, on which Orvieto is built, and then, crossing a low divide, runs out of our district.

From Rome to Naples the main line crosses the Campagna and ascends the northern slope of the Alban group in a long curve, to the saddle where the volcanic mass joins the limestone range. Here, beneath the town of Palestrina, which lies higher up on the slope of the range, the track runs in a deep cut and finally, if I remember aright, enters a tunnel, thus avoiding the last part of the surface ascent. On the way to this saddle one may see ten or a dozen examples of inverted topography; that is, of former radial valleys, which were flooded with thin and narrow lava streams, and which now appear as flat ridge-spurs, the present shallow valleys being eroded on the weaker volcanic tuff that formerly constituted the ridges. The railroad crosses the new valleys on embankments, and passes through the ridges in cuts. It is in these cuts that one sees, even from the windows of a passing train—better on the slow ascent from Rome than on the more rapid descend to it—the evidence that the present ridges follow the course of former valleys; for on entering and leaving a cut, the thin border of the firm columnar lava is seen lying on the red

weathered tuff; while in the middle of the cut the base of the lava is not revealed: that is, the depth of the cut is there less than the thickness of the lava stream: hence the lava stream occupies an ancient valley. After passing the saddle at Palestrina and descending to an alluvial valley, that of the Sacco, south of the Alban group, one may see the Lepini mountains to the west, their eastern face being a maturely dissected fault scarp, along the base of which a recent renewal of up-faulting has produced a fresh scarp 30 to 65 feet in height and nearly four miles in length. This is easily visible from the passing train; but it is much better seen by giving a day to a walk between the villages of Scurgola and Morolo.

Excursions around Rome. Local excursions from Rome add details to this story. In the Alban group, the main caldera is, as noted above, indistinct; the eastern half of its rim is seen in a semi-circle of knobs and ridges, but its basin, if ever engulfed, has been filled again by later eruptions, the lavas of which form a new central cone, culminating in two summits (3090, 3130 feet) near the lofty village of Rocca di Papa. There are three minor pit-craters of great perfection which interrupt the west rim of the greater caldera; the Lago di Albano lies in one, the Lago di Nemi in another, while the third has a dry floor, called the Valle di Ariccia. These may be reached by various lines of rail and tramway, one of which tunnels into the Albano caldera on the north, follows its wall for one and a half miles and then tunnels out on the west side. The old line to Naples circles round the west slope of the Albano mass, and is joined by the new line on the descent to the valley of the Sacco. Delightful walks may be taken from village to village in the Alban mountains.

In Bracciano the caldera is a marked feature, although its inner walls are now maturely graded, so that they show few outcrops of lava beds; and one of the exterior valleys has been deepened enough—the last touch being artificial—to drain the lake through a notch in the caldera rim on its southeastern side. An acqueduct is led out by the same notch to carry water to Rome. The train for this excursion starts from the Trastevere station, and slowly climbs northwestward up the long pasture slopes, disclosing fine views over the city as well as far to the south and west, until it reaches a notch in the western side of the caldera rim; and then descends a little to the village. A fine view of the caldera is to be had by walking up to the crest of the rim (1075 feet) two-thirds of a mile west of the station. The village lies in the foreground, with its massive medieval castle on a knob that rises over the border of the circular lake. The diameter of the caldera is over six miles; the altitude of its rim varies from 1086 to 1745 feet; the diameter of the lake is 5 or 5½ miles; its surface stands at about 528 feet altitude.

Tivoli, a picturesque town on the flanks of the limestone range nearly seventeen miles east of Rome, is reached by train, from which one has good views of some of the radial valleys of the Campagna slope on leav-

ing the city, and by which one then crosses a broad lowland behind the volcanic saddle, where much travertine has been deposited. Tivoli lies at the mouth of a mature valley, of which the evenly graded sides must have once descended in open V form to the level of the plain below; but the valley is now peculiar in being aggraded at its mouth to a depth of over 300 feet by travertine deposits, so that the stream now cascades down the travertine barrier to the plain, on which it once flowed out at even grade. A singular item here is that the stream is called the Aniene above the falls and the Teverone below. Falls due to travertine barriers are known in limestone regions, such as Bosnia and Dalmatia, and parts of Central America, but they are comparatively rare. Travertine deposits of this kind are perhaps due to the emergence of a spring in the river bed; the spring having become heavily charged with limestone while it was under pressure in subterranean passages, and some of the limestone being deposited at the spring outlet. In some of the Bosnian rivers the deposition of travertine is still in progress, as may be known by the formation of many small basins with graceful convex rims, which rise terrace-like one over the other; the river then cascades down the whole series. In certain cases the travertine barrier has grown so rapidly that the river is laked behind it; such being the present fate of a river, called the Kerka, a few miles inland from Sebenico on the mid-Dalmatian coast. But at Tivoli, there is an aggraded valley-flat instead of a lake upstream from the barrier; and the barrier itself is somewhat out of repair, as if upgrowth had been replaced by river erosion; hence, the Teverone now plunges down through a gorge of its own erosion. Once upon a time the slightly incised notch at the head of the gorge did not suffice to discharge the waters of a flood, so that the village of Tivoli on the barrier was then in part submerged. The Pope of that time, as one may learn from Baedeker, had an additional channel cut through the soft rock, thus giving two outlets to the stream: the artificial branch descends in cascades on the front of the travertine slope, little incised and visible from afar.

TOPOGRAPHICAL MAPS. All of the features here described and many more are shown on the large-scale topographical maps of Italy, "la Grande Carta Topografica del Regno d'Italia alla Scala di 1:100,000." The separate sheets cost 1.50 lire, or about 30 cents. The most serviceable ones are numbers 129, 130, 135, 136, 137, 143, 144, 149, 150, 158. The difficulty however here is not alone that the map-sheets are rather expensive, but that their sale by the "Instituto geografico militare" at Florence, where they are engraved and printed, is sometimes placed under certain restrictions, apparently for strategic reasons. Their purchase may need special permission from the Ministry of War at Rome. This might possibly be secured through our Bureau of Education, Washington, D. C.

(Concluded in May.)

PRIMARY AIMS IN GEOGRAPHY TEACHING IN THE GRAMMAR GRADES

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IF THE title of this article were put in the form of a question and submitted to fifty different teachers, it is more than probable that fifty different answers would be returned. These answers, varying as they might in detail, would probably fall in essential particulars into two groups, and brief comparison would show that between these groups there is a deep gulf fixed. Teachers of one group believe that the object of the study of geography is the acquisition of a certain mass of definite, organized material, useful in its application in later student life. Teachers of the other, realizing the impossibility of the pupil's acquiring in a few years an encyclopedic mass of material which shall always be equal to the demand upon it, hold that the purpose of geography teaching is to rouse in the pupil a desire to follow out each geographic lead to its logical end, to teach him where to seek geographic information and how to use it, and to create in him an interest in all things geographic—to give him, in short, a working knowledge of geography.

To these differing methods writers of recent articles have applied the terms old geography and new, though the new geography was not unknown in the days of our grandfathers and the old geography is unhappily still with us. Without characterizing the old geography out of hand as necessarily implying work without motive or interest on the part of the pupil, it may be freely asserted that the aim of the new geography is the leading of the children to the study of the world through the open door of their interests and experiences. The difference is a greater one than that of the old geography versus the new; it is the static in education as opposed to the dynamic.

It is singular that geography is among the last of the subjects of the grammar school to respond generally to the demand of modern education that all study should enter into and lead from the experiences of the children. The reasons for its backwardness are many and should challenge the serious consideration of teachers. Let us look at some of them.

Why the "Old Geography" still lingers

The text books themselves are undoubtedly a most potent factor in perpetuating the mistaken methods of the old geography. For one thing, the very best texts are crowded with facts and statistics too briefly told to be interesting. In the second place, the same text book is used in two, sometimes in three grades,—a grave mistake, since children grow from year to year in their understanding and use of language and therefore a

book suited to the pupils in the fifth grade is inadequate for those in the seventh and, conversely, a book quite suitable for children of the eighth grade is too difficult for those of the fifth. Thirdly, even the best geographies are written from the standpoint of the mature geographer, who disregards the interests of the children for whom he writes. Without question no geography worth the name can be written by one who is not an expert in the subject, but until that man is found who, with the wisdom of the trained geographer, combines a sympathetic knowledge of the interests of childhood, we shall look in vain for suitable texts. Other causes which contribute to unsatisfactory conditions are the use of geography text books as readers, with only occasional question or comment on the subject matter; the perfunctory study in which so many pages or paragraphs are to be covered in a given time; the use of set questions on text or map without reference to the vital questions raised by the children. Lack of equipment, too; books, magazines, maps, globes, and pictures are as indispensable to the geography teacher as tools are to a carpenter. Moreover, in spite of the many teachers who are able to teach the subject in a way to make it fill the place to which its intrinsic worth entitles it, there are still many to whom geography is a sealed book.

It is an easy matter to outline the essential aims of a body of teachers who are in accord as to the fundamentals of a subject. When, however, teachers hold opinions so diverse and follow methods so at variance as they do in geography, the task becomes more difficult. One may theorize indefinitely and without concrete examples fail to convince. In the following discussion let us see how far conditions now obtaining in the teaching of geography in the elementary schools of Chicago may be made illustrative of the primary aims of geography teaching in the elementary grades, whenever and wherever pursued. If by means of this single case it can be shown that certain aims are worthy of realization and, further, that their realization can be reached only through the methods of the new geography, the purpose of this paper will have been accomplished.

Illustrations from Elementary Schools of Chicago

The sixth, seventh, and eighth years of the elementary school are, in Chicago, usually called the grammar grades. To these grades the pupil brings from his work in the fourth year a knowledge of direction and the ability to read simple maps, an ability he has attained by mapping some area well known to him, and by studying maps of unknown areas, which he peoples and makes real by means of pictures and simple descriptions. He has gained, too, some general ideas of the world as a whole, brought to him through the study of certain products with which he is familiar. A few examples will make this clear. A general study of tea has introduced him to China and India. He associates silk with Japan. Coffee or india rubber has made South America more than a name to him. He

has followed in a broad way the routes by which these familiar commodities come to him, thus learning the relative position of ocean and continent and a few definite places on the earth's surface; he learns, for instance that his coffee came over the Atlantic from Santos to New York, then overland to Chicago to the wholesale house from which his particular grocer bought it in large packages to sell later to him in smaller. From the study of the fur-bearing animals of the north and the fruits of the tropics he has gained some notion of the variation of climate with altitude. From the fifth year he brings some elementary knowledge, rather more detailed, of the units that build up continents—of mountains, plains, plateaus. In short, his work in the earlier grades has brought him many geographical concepts, but he has built his world, so to speak, with big blocks.

What must the grammar grade do for him in order that its work may be something more than greater elaboration of the facts acquired in earlier years?

The following course of study for pupils of the sixth grade recently laid down in Chicago, attempts to answer this question. The method used in the sixth grade is used with different subject matter and broader treatment in the first semesters of the seventh and eighth grades.

COURSE OF STUDY

SIXTH GRADE—A GENERAL STUDY OF NORTH AMERICA

Note. In the sixth grade the course is planned to secure the proficiency of pupils in reading and interpreting maps and graphs.

First Half Year of the Grade

Map study of the continental shelf; currents; temperature; rainfall; vegetation; products.

Globe study: the position of North America with reference to the other continents; latitude and longitude.

THE UNITED STATES.

Note. A study of the group of states centering about Chicago, followed by a study of the rest of the states of the Mississippi Valley, an area whose industries are largely agricultural.

A study of the Plateau States, an area whose industries are largely mining and grazing, followed by a study of the Pacific States, a region with similar products and industries.

The study of the Southern States, largely agricultural, to be followed by the Mid-Atlantic and New England States, which receive and manufacture much raw material from the other groups of states.

The outline for the home group of states is given in detail. It is intended that the same outline be followed in the various groups of states into which the United States is divided.

THE STATES OF THE MISSISSIPPI BASIN.

The Northeastern Section. Map and picture study to show the leading characteristics of this group of states; industries; products.

A study of production maps: a comparative study of maps of different scales; drawing of rapid sketch maps of this group of states to show their relation to each other and to the Great Lakes.

Chicago—a great central market: Indianapolis—a railroad center; Marquette—a mining center; Dayton—a manufacturing city.

The Northwestern Section. Dry farming, wheat farms.

The Southeastern Section. Mammoth Cave; the mountaineers of Tennessee; the Blue Grass region, Memphis; the southern lumber market; Birmingham—a manufacturing city.

The Southwestern Section. Galveston; New Orleans; the jetties of the Mississippi River.

Second Half Year of the Sixth Grade

THE PLATEAU STATES. Irrigation; ranching; the Grand Canyon of the Colorado; the Petrified Forests of Arizona; Great Salt Lake; Goldfield; Denver; the Moki Tribe; the Navajo Tribe.

THE PACIFIC STATES. The five great trans-continental roads to the Pacific; hydraulic and placer mining; orange culture; Yosemite Park; San Francisco; Seattle; salmon fishing of Columbia River; water routes in Plateau and Pacific States; harbors of Pacific Coast.

THE SOUTHERN ATLANTIC STATES. The Everglades of Florida; cotton; Florida East Coast Railway.

THE MID-ATLANTIC STATES. The Fall Line; Hudson River; Erie Canal; Ocean Steamship Liues; Pittsburg compared with Chicago; brick, tile, and pottery of New Jersey; truck farming of New Jersey.

THE NEW ENGLAND STATES. Fisheries; Vermont (quarrying); Lynn (shoe manufacturing); Waterbury (clocks); Bangor (lumbering); Providence (jewelry); Manchester (manufacturing of cotton goods).

DEPENDENCIES OF THE UNITED STATES. Alaska, Hawaii, the Philippines, Porto Rico and other islands.

CANADA AND MEXICO. Map and picture study to show surface features, and products; comparison with United States as to climate, products and development; trade relations.

CUBA

Comparative Study of North and South America. With reference to size, regularity of coast line, height of mountains, length of rivers, number and size of lakes; with reference to number and size of arid regions, areas of great rainfall, mean annual temperature, vegetation, density of population; products common to both countries; products peculiar to each. Study of South America's foreign trade with North America; with Europe.

As a glance will show, the subject of the year's study concerns itself chiefly with the United States, but not the United States of the text book. Instead of beginning with the study of the New England States and following with the various groups of states from east to west, the children start with what they know best,—Chicago, the Central Market of the Mississippi Valley. Using a great variety of relief, rainfall, production and railroad maps, they trace to Chicago some of the products which the various sections send; wheat, iron ore, stock, lumber, etc. noting the routes by rail or water along which each may be sent. A typical wheat farm is studied to learn how the wheat is planted, harvested, and transported to Chicago; the surface of that area will suggest the advantage of the use of machinery in planting and harvesting the wheat; and this consideration will lead to the fact that Chicago ships back such machinery to the farmer along the same lines of transportation by which the wheat came.

In this simple way will be introduced the basic idea of all commerce, i. e., the exchange of that which countries have in abundance for that which they lack. Compare the results obtained from study such as this with, say, reading with comment, or with learning to recite, such information as the following (the invention of the writer, but certainly typical of average text book treatment): 'North Dakota is for the most part level. Great quantities of wheat are raised as the soil is fertile and the rainfall is sufficient and the land is so level that it permits the use of machinery for planting, harvesting, etc. Because one machine can do the work of several men, the farms are of great extent.'

Or take a piece of work of another type—an investigation by a single pupil or a group of pupils leading to an understanding of the dry farming of Kansas, the method of husbanding a scanty supply of rain so that crops may be raised where before crops failed. Here again the rainfall map may be of use. It is not to be expected that such a study can be made with the detail and finish within the powers of older students, but there are few sixth grade classes in which there will not be found some children who can read a simple description of the process—a process that makes the farming of certain areas of the West unique—and tell the story to his classmates so that they will understand it; and the encouragement thus given to individual enterprise will be found stimulating not to the individual only but to the class.

From this general consideration of the elements affecting the commercial importance of their own city, the class is taken on into other sections of the Mississippi Basin. Time is lacking for following this procedure in its detail. For special study particular topics are selected; peculiar peoples, for instance, such as the mountaineers of Kentucky and Tennessee; unique natural features, such as the Mammoth Cave; industrial centers, well and widely known. Incidental information as to their location, the

character of their surroundings, the routes by which they may be reached furnish the geographic setting, while the item itself gives color and interest. It is skill in placing emphasis which makes all such work effective and interesting; the absence of emphasis and the hurried survey of a mass of detail reduces geography to a mere statistical enumeration of facts. The study of certain notable or striking characteristics establishes centers of interest here and there around which the geographic material gained by the pupil in later travel or study will naturally group itself.

In the second semester of the sixth grade the same plan is followed, the topics for study of each group of states being carefully chosen.

Some one may inquire, "But what part does the text book play in such a scheme?" It may be replied,—true, the text book is and must remain the principal source of the school child's information, but by this method, text book use is rationalized. The children do not "take" certain pages, but on the other hand, their interest, if really aroused, will move them to seek all information the book affords. They will come to regard the text book not as an end, but as a means to an end, and by their proper use of the book will be measured their efficiency as students. To help them to acquire the power to use it wisely is perhaps the first aim in teaching geography throughout the grammar grades.

Other Aims in Teaching Geography

Other aims in teaching geography have already been indicated. One of importance is to teach children to use maps intelligently, and by a comparison of various sorts of maps; i. e., rainfall, physical, political maps, maps of productions, of mineral resources, and of transportation routes, to draw inferences to the interaction of the geographic elements they picture and the relation of these geographic elements to mankind.

Still another aim is to teach the pupil to obtain material to supplement the text book. For the children of the later grammar grades, encyclopedias, magazine articles, and standard books of travel all yield material suitable to their understanding, and it should be the aim of every teacher to open up to the pupils such mines of interest.

In and beyond all these, of course, there must be the aim to relate the geography work to the life of the pupil. The logical approach to every geography lesson is in the concrete illustration which lies at his hand and is already within his experience. The bread in his lunch-box, the elevator, black and gloomy across the street, or the freight cars as they pass the school bringing in the wheat from some Dakota farm, may furnish the open door to the unknown. The achievement of all of these ends on the part of the teacher and children will give the children that which has been called a working knowledge of geography—will give them, moreover, the power to help themselves.

GEOGRAPHIC INFLUENCES IN THE DEVELOPMENT OF ILLINOIS

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INSTEAD of presenting an article on the above topic from my own study and observations, I desire to direct attention specifically to the Geological Map of Illinois and the five "Educational Bulletins" of the Illinois State Geological Survey which have appeared during the past three years. These publications deal with the subject of this article for certain areas of the state. They are prepared to further the teaching of Geography, Physiography, and Geology in the schools of the state and elsewhere. They are among the very best productions of modern geography, and should be sought and thoroughly studied by every teacher of Geography and History in the upper grammar grades and high schools.

This article will have served its purpose if it stimulates a goodly number of the readers of the Journal of Geography to a careful perusal of these splendid contributions to the literature of modern geography.

Information concerning the bulletins, and how to procure them, may be obtained by addressing the Director, Illinois Geological Survey, Urbana, Illinois.

The Bulletins to which attention is here directed are the following:

Bulletin No. 6.—The Geological Map of Illinois with 32 pages of descriptive matter.

Bulletin No. 7.—Physical Geography of the Evanston-Waukegan Region, 102 pages.

Bulletin No. 11.—Physical Features of the Des Plaines Valley, 103 pages.

Bulletin No. 12.—Physiography of the St. Louis Area, 83 pages.

Bulletin No. 13.—The Mississippi Valley between Savanna and Davenport, 96 pages.

Bulletin No. 15.—Geography of the Middle Illinois Valley, 128 pages.

For this article, quotations are given from these Bulletins bearing directly on the subject—"Geographic Influences in the Development of Illinois."

Bulletin No. 6.—The Geological Map of Illinois

This bulletin contains a large map of the state showing geological characters. The map is accompanied by a clear, concise description of the Geological Formations found within the State. In the section devoted to the Pleistocene, we find the following statement concerning the thickness of the glacial drift:

"In southern Illinois, to about the latitude of St. Louis, the drift deposits are usually scarcely thirty feet in thickness and have not obscured the underlying rock surface sufficiently to have greatly changed the principal preglacial lines of drainage, but north of this area the drift is much thicker, sometimes exceeding 150 feet, so that, with the exception of the bluffs along the larger streams the underlying rock surface is usually completely obscured. The average thickness of the drift for the entire glaciated portion of the state is about 75 feet."

Bulletin No. 7.—Physical Geography of the Evanston-Waukegan Region.

The following is quoted from the Director's letter of transmittal:

"This report forms the first of a series now in preparation of 'Educational Bulletins.' These have been called educational because their purpose is to put useful information concerning the geology and geography of the state, or some parts of it, before those who are not special students of these sciences. Two classes of people are kept especially in mind in the preparation of these bulletins. These are: (1) Intelligent citizens whose attention, for one reason or another, has never been directed to geology. (2) Teachers of physical geography and geology. These sciences are now taught somewhat generally in high schools, and might be pursued with great advantage much more widely than now in the country schools."

The following quotations from the section on "Geographic Conditions and Settlement" serve to show how these bulletins will aid not only the high school teacher, but the teacher of Home Geography in the primary grades, especially of the schools in the region treated by the Bulletin.

"*Location of Roads.*—Before the railroad was built north of Chicago there was a government highway from Fort Dearborn to Green Bay known as the Green Bay Road. The location of this road was controlled by physiographic conditions. In the southern portion of the district, just north of Chicago, it was located on a beach ridge. This old shore line offered an even grade where the land was drier than on either side, and where the road material was sand and gravel. Ridge road, in Evanston, is a portion of the old Green Bay road. It is conspicuously above the general level of the lake plain and the homes now located there are favored by a good outlook and by good drainage.

"Through Wilmette the government road was unfortunately near the lake cliff and was frequently washed away by the waves.

"A short distance north of Winnetka the Green Bay road turned westward to avoid crossing the numerous ravines, and thence northward. The old road turned westward just far enough to reach the uneroded rolling upland, and the modern steam and electric roads have taken advantage of the same route just west of most of the ravines."

"*Farms.*—In the southern portion of the region, the lowlands between

the ancient beaches are largely used as truck farms. These areas were lagoons during certain stages in the retreat of the lake waters and from the abundance of decaying vegetable matter in such places came to have rich soils. The tendency of late has been to cover large portions of these lagoons with hot-houses and to raise vegetables for the Chicago and North Shore markets at all seasons of the year. The rolling upland is excellent farm land."

"*Suburban and Summer Homes.*—The ravine country east of the railroad between Winnetka and North Chicago is largely devoted to suburban and summer homes. 'The rate at which the lake bluff has been encroached upon by wave action has become a matter of much concern to the residents. It is estimated that during the thirty years from 1860 to 1890, a strip about 150 feet in width was undermined and carried into the lake. This amounts to about 500 acres, representing at present valuation nearly one million dollars' worth of property."

"*The Economic Uses of the Glacial Material.*—The clay brought to this region by the glacier has been used in the manufacture of brick at several places. The beach gravels are used in concrete work, for roofing and as road material. Large quantities of a fine kind of gravel, torpedo gravel, are used in concrete and at Waukegan in the manufacture of ready roofing material."

Bulletin 11.—Physical Features of the Des Plaines Valley.

From the Director's letter of transmittal:

"The large demand for the preceding bulletin of this series (Bulletin 7) indicates a very widespread and live interest in the subject of physical geography among teachers and laymen. An intelligent insight into one's environment is the desire of every normal person and it is felt that these little bulletins serve a very real need even of those not concerned with teaching."

Had the Valparaiso moraine formed an unbroken ridge around the head of Lake Michigan, no canal building would have been possible from Chicago to the Illinois river. The "Chicago Outlet" of the ancient Lake Chicago is the geographic feature which has made canals possible and profitable in Illinois. The following is quoted from the section of Bulletin 11 on "History of the Chicago Portage and Canals."

"The divide between the Des Plaines river and Lake Michigan stands only 592 feet above the sea—less than twelve feet above the present lake."

"The project of a ship canal across the Chicago portage was laid before Congress by Albert Gallatin, in his famous report of 1808, on means of internal communications.

"The canal cost the State and the City of Chicago about $10,000,000, only one-tenth the cost of the Erie canal; and two-thirds of this was paid by a land grant. In 1885 it was estimated that the canal had saved the people of Illinois $180,000,000 in freight charges.

"The rapid growth of Chicago soon made the Illinois-Michigan canal inadequate for the discharge of its sewage. The work of excavating the drainage canal was begun in 1892 and finished in 1900. Now that the sanitary canal is again nearly outgrown by the great city, repeated efforts are being made to obtain the privilege to enlarge it and divert a larger volume of water from Lake Michigan, thus insuring the proper dilution of the sewage. The extension of the channel to Joliet and La Salle, and the improvement of the Illinois river so as to give a deep waterway across the state to the Mississippi and thus to the gulf, even if not immediately possible, is none-the-less inevitable."

Bulletin No. 12.—Physiography of the St. Louis Area.

From the Director's letter of transmittal:

"This forms the third of the series of Educational Bulletins. They are meeting with a great demand from all over the state. A number of others will follow this one rapidly."

The following is quoted from Bulletin 12:

"The area embraced in this report lies partly in Illinois and partly in Missouri. It comprises the St. Louis and East St. Louis quadrangles, which together make a rectangle 31 miles long from east to west and 17¼ miles wide, and have an area of about 535 square miles. The cities of St. Louis and East St. Louis are near the center. Approximately half of this rectangle lies in Missouri."

Brief quotations follow from the section on "Conditions Affecting Habitation."

"Two types of soil are found, the one formed on the loess, the other on the alluvium, the former covering the entire upland region, the latter the great flood-plains. That part of the United States in which loess forms the basis of the soil is perhaps its most remarkable agricultural region. The alluvium of the Mississippi flood-plain is fertile in places. This is particularly true near the Illinois bluffs where the wash from the bluffs has mingled a large proportion of loess with the alluvium from other sources. Here too, the flood-plain is free from overflow, hence agriculture flourishes."

"The life of the people in this area is much influenced by certain mineral resources. Prominent among these is coal. Many mines are clustered about Belleville and Collinsville, which places owe much of their population and importance to this industry. The coal comes from a single seam which averages about 6 feet in thickness, and is commonly reached at a depth of 150 or 160 feet below the uplands."

"A second mineral resource of great importance and forming the basis of an industry which supports a large population, is clay. The manufacture of clay products is carried on by some of the leading factories of the world. These produce fire brick, retorts, 'glass pot' clay, building brick, sewer pipe, and terra cotta. The region here described,

and chiefly the very small district known as Cheltenham, produced in 1905, about $5,000,000 worth of clay products or about one-thirtieth of the entire output of the United States."

"Several of the formations furnish stone for building and for road material. Different beds of the same formation differ greatly in structural value, hence the products of one quarry are put to a great variety of uses. Much of the stone is used in foundations, some in superstructures, some as curbing and sewer plates. Some of the purest limestone is ground up into 'whiting.' When all the stone suited to these purposes has been removed there remains a large amount which is valuable for concrete or road material."

"The water used in the great cities along the Mississippi is chiefly from public supplies and is derived from the Mississippi. The hard and muddy waters of that river are rendered perfectly clear, relatively soft, and entirely agreeable to the taste by modern methods of treatment. The same processes are not used by all the municipalities, but straining, settling, aeration, filtering, and chemical treatment with iron sulphate and quicklime, are all employed in one or more public systems. Thus is the great population supplied with an abundance of wholesome water."

BULLETIN NO. 13. THE MISSISSIPPI.

Valley between Savanna and Davenport.

The following is quoted from Bulletin 13:

"The area discussed in this bulletin is partly in Illinois, and partly in Iowa. It lies along the Mississippi river from Savanna on the north, to the mouth of Rock river on the south, a distance of about 60 miles. The stronger physiographic features of the region are centered along the Mississippi valley, and the work done in the preparation of this bulletin was extended back from the main river, only far enough to cover the lower courses of the larger tributaries."

"The second bottoms occur in the broader parts of the Mississippi and tributary valleys. The largest area occurs on the Illinois side of the river and is 15 miles long, and 2 to 4 miles wide. The second bottoms usually lie between the flood-plains on the one hand and the valley bluffs on the other. Where the valleys are narrow the second bottoms are absent, or represented by very narrow benches (terraces) only. The most conspicuous elevations on the second bottom are the sand dunes.

"The soil of the second bottoms is usually black and sandy, but it grades into humus soil in the swamps, and to nearly pure sand in the dune areas. The second bottoms form one of the most fertile areas of the region. Here rich loose soils are well adapted to the cultivation of potatoes, and this is one of the chief crops of the area. Corn is also grown. The more sandy portions yield large crops of melons.

"The flood-plain between Savanna and Fulton is one to two miles wide, and is separated from the second bottoms which occupy the east

part of the valley by an abrupt rise of 10 to 20 feet. The surface material of the flood-plains is an alluvial soil, usually black and rich in humus. It has a thickness of 5 to 15 feet. Where the slope is sufficient to drain the land, the flood-plains form good farming land. The soil is more compact than that of the second bottoms and corn is the chief crop of the area."

BULLETIN NO. 15. GEOGRAPHY OF THE MIDDLE ILLINOIS VALLEY.

From the Director's letter of transmittal:

"A final chapter of most interesting historical character describes the settlement and development of the Peoria-Hennepin region from the time of the pioneers who emigrated from the South and from New England. The distribution of the early population, its conquest of adverse conditions and final development into a community of great interests, is skillfully traced."

This bulletin is of interest to the general reader and to the teacher and student of history as well as of geography. The following quotations are taken from the final chapter referred to above.

"Before the opening of the Erie canal, the journey from New England to the West was slow, difficult, and expensive. Emigrants from western New England could use the Mohawk and Genesee turnpike to Lake Erie, or the Catskill turnpike to the upper Allegheny. Those leaving eastern New England usually went by sea to Philadelphia or Baltimore and thence by stage over the Allegheny mountains to the Ohio river. The household goods were sent from Boston by sea to New Orleans and up the Mississippi. Navigation was late in developing upon Lake Michigan, and not until 1834 could emigrants count with certainty upon transportation to Chicago."

"The prairies of northern Illinois aroused the wonder of all early travelers. Quite as much as any other factor, the distribution of woodland and prairie affected the settlement and early life of the region. The prairies were generally shunned by the first comers for several reasons: (1) Absence of trees was thought to mean that they were infertile. (2) Timber was imperatively needed for buildings, fences, and fuel. (3) They did not afford running water for stock or mills. (4) There was no protection from the bitter winds of winter. (5) To the farmer, the prairies with their tough sod and matted roots constituted a new and altogether unknown problem. As late as 1836 the few who thought the prairies capable of occupation were regarded as visionaries."

The foregoing selections indicate the general character and high value of these five "Educational Bulletins," but give only a suggestion of the wealth of material to be found in their 500 pages of printed matter with numerous diagrams, pictures, and maps.

GEOGRAPHY IN GERMANY AND IN THE UNITED STATES*

By Martha K. Genthe, Chemnitz, Germany

YOU ask me if geography is taught better in Germany than in the United States. The answer to this question must depend very much upon my ideas as to what constitutes the best course in geography. Any two persons will, according to their opinions on that subject, give very different answers to that question.

I shall not claim, therefore, to offer a solution of your problem, but will submit simply my personal opinion on the matter, based, on one hand, on my idea of geography as it ought to be taught, and on the other, on my personal acquaintance with German and American schools.

As to what constitutes a good course in geography I beg to refer you to an earlier article of mine in the Journal of Geography a few years ago (Vol. IV, No. 4, April 1905). The opinions expressed therein are the same that I hold to-day.

My opinions are, of course, much influenced by my own training at German universities, and hence it is obvious that they are more likely to be found in practice in German schools than in those of the United States, so that you could hardly call my opinions unbiased.

I think I shall be able, however, to lay aside any special partiality for my own pet theories, because I understand the American situation well enough to appreciate the difficulties which stand, for some time to come at least, in the way of such teaching in your country.

I will examine, on one hand, the special needs and opportunities of each country with regard to the study of geography, and then try to determine how far that country is living up to its opportunities. The country in which the ratio of opportunity to results is the more favorable may be justly said to have geography taught better.

The student of geography in Germany, as I understand the problem, needs especially these four things:

(1) A more or less intimate acquaintance with his own town, district, state, and country; (2) a satisfactory knowledge of the foreign countries most closely related to his own; (3) a general knowledge of the rest of the world; (4) the ability to think geographically, e. g. to delineate, in the different problems of life and the different branches of study, the influence of geographical factors, and correctly to estimate their respective importance.

The following may be designated as the special opportunities which Germany offers towards the best possible results in the teaching of geog-

*Mrs. Genthe's wide knowledge of geography teaching in both Germany and the United States makes this paper a particularly welcome contribution to our series of discussions of this topic.—*Editors.*

raphy: (1) The existence at every university of a special department of geography which is second to no other department at the respective universities, and, in some of them, second to none in the world. Hence there is a constant and regular supply of teachers of geography for all kinds of schools, who are specialists in their line and who work incessantly for the betterment of geographical instruction.

(2) The abundant supply of excellent maps and atlases for all kinds of schools.

(3) The innate love of the German people for walking and wandering and, as far as the young men are concerned, the advantages of compulsory military service which takes every one over a large part of the territory of his country during his term of service, so that practical geographical experience and training is not limited to the specialist.

The influence of these conditions on teaching is this:

(1) Class instruction can be easily supplemented by shorter and longer trips and tramps—from an afternoon to a fortnight in duration—where, on holidays or during vacation, the teacher can awaken the interest in the real things in geography in addition to the academic treatment.

(2) The map, not the text book, is made the foundation of the lesson.

(3) Owing to the overcrowded curriculum of the higher schools, especially the Gymnasium in which the classical languages are still considered the only royal road to success, the amount of time and attention given to the subject at these schools is very inadequate considering the excellent training of the teachers. In many cases the schools do not offer enough work in geography to fill the schedule of the teacher, and he must teach all sorts of odd subjects in order to get the required number of periods of teaching; or the small amount of geography is not thought worth the engagement of a specialist, and geography continues to be taught by mathematicians, historians, philologists, and the like.

The rest of the higher schools do better; especially at the Oberrealschule, where Latin is not compulsory, and the Realschule where it is not taught at all, geography is taught not only as a useful subject but as one which makes for culture; yet even here the fight is still going on in many places to give geography equal chances with the rest of the natural sciences.

In the elementary schools the conditions are most favorable, because there the amount of time alotted to geography is the same as that devoted to the other sciences, and it extends through the whole course. Laboratories are rarely provided, but good maps, models, and outdoor study serve the purpose just as well.

The largest room for improvement is, therefore, in the classical and semi-classical higher schools. In spite of the high standard of geographic scholarship, therefore, the influence of this on the educated classes is com-

paratively small, owing to the anti-scientific spirit of the classical schools.

America, on the other hand, is handicapped geographically

(1) By the lack of general recognition of geography as a scientific study, for the number of universities where it is adequately represented, though increasing, is still small. Hence, the teaching profession is not so well supplied with geographical specialists who can give weight to the arguments in favor of better courses in geography. When high schools teach it at all, it is generally limited to a one-year course which is even less than the amount given at the German classical schools.

(2) To make matters worse, many schools are compelled to employ teachers without even any pedagogical training, at whose hands geography does not fare better than any other subject.

(3) There is not, in America, the inherited stock of local geographical and historical investigation which in Germany has made many a plain school teacher a specialist on home geography. Such a teacher, by virtue of his intimate knowledge of the subject, can from the very beginning train the children in the habit of thinking geographically and thus pave the way for a proper attitude toward the subject with regard to everything that is to follow.

(4) Most school maps are rather poor works of cartographic art, to say nothing of those in which this art is conspicuous by its complete absence, so that the text must inevitably play a larger part in the lessons and there is constant danger of geography's becoming a mere book study.

To balance these disadvantages, America has the following opportunities:

(1) Her admirable government service with its low priced topographic maps and free scientific publications;

(2) A more elastic curriculum of the higher schools in which changes can be introduced more easily than in the rigid schedules of the German school system;

(3) The resources of a country much larger and richer than Germany by means of which the schools can have almost anything that money can buy—which is quite a good deal, after all;

(4) The adventurous spirit of the American people who, accustomed to long distances and large areas, find themselves mentally much nearer the rest of the world than most other nations, so that they seem predestined to become good geographers as soon as they are given a chance.

What America needs in a course of geography, is this:

(1) A thorough knowledge of the home country, its development, its resources, and how to deal with them;

(2) A special acquaintance with those countries of Europe from which the larger part of its people and institutions derive their origin, and of the geographic-historic relations between the two hemispheres;

(3) The same kind of knowledge about those foreign countries which are of special interest for American commerce and politics;

(4) A general knowledge of the rest of the world;

(5) Geographical thinking as above.

What can America do to effectuate this?

(1) Encourage by all means the study of local geography by the younger generation of geographers who graduate from the universities in increasing numbers every year. Found local and state geographical societies wherever a couple of trained geographers are near to take the lead (without trained leaders they would not be worth founding) and while drawing the line strictly between amateur and scientific work, enlist the co-operation of the amateurs because amateur contributions often furnish important data not elsewhere obtainable. Every school teacher qualified for such leadership ought to consider it his sacred duty to do such work for his science as well as for his country.

(2) Let not the cost stand in the way of better maps any longer, and let no child leave school without being able to use the topographic map.

(3) Allow more time for European countries, and do not treat them only as the buyers or sellers in American trade. It is impossible to fully understand America with none but a tourist's or merchant's knowledge of Europe.

(4) Employ none but trained geographers at the high schools to teach geography, and do not allow them to get tired of asking for a three years' course in it for every high school, because the culture value of geography increases in proportion to the age and maturity of the student.

(5) The same, even more emphatically, must be said of the College. As long as every respectable College has not placed geography on a par with other branches of science, public opinion will not consider it a scientific subject. Public opinion is, however, the most powerful influence in determining the character of public school teaching. The interest in, and means for, geographical matters will increase in proportion as geography ceases to be ranked with the three R's. When wider circles begin to see that geography means more than names, figures, and products, half the battle will be won.

None, however, but those teachers who are geographers themselves, can effectuate such a change. Hence the problem of what to do for the improvement of geography (as for the improvement of any other subject) is to improve the teachers. If there is any foundation to the belief that geography is taught better in Germany than in America, it can be explained only through the better quality of the average teacher.

The student who happens to have a good teacher, other things being equal, will always be taught best.

THREE REFERENCE BOOKS

The three books described on this page are recommended to high schools for their reference shelves. Mill's International Geography deals with general geography, Salisbury's Physiography with physical geography, and Chisholm's Handbook of Commercial Geography, with the most important and practicable phase of applied geography.

MILL'S INTERNATIONAL GEOGRAPHY. This is the only complete and authoritative advanced one-book text on the geography of the world. It ranks with the many volumes of Reclus and of Stanford's Compendium in completeness and authority, though compressed to a little over 1,000 pages. It was edited by H. R. Mill and is international in authorship, having been written by more than seventy authors, in nearly every case either a native of the country, a resident, or an experienced traveller. In America, for example, United States is described by W. M. Davis; in Europe, G. G. Chisholm describes the continent, H. R. Mill describes England, Wales and Scotland, Albert de Lapparent describes France, Albrecht Penck describes Austria-Hungary, A. Kirchhoff describes Germany, etc. It is not merely a compilation, a gazetteer, or an encyclopedia. It is a readable book. D. Appleton and Co., New York, $3.50.

SALISBURY'S PHYSIOGRAPHY. There are many modern text-books of elementary physical geography, or physiography, for high school use but until R. D. Salisbury prepared this book there was no advanced American publication, covering the whole subject, for college use or for reference in high school libraries. It has over 750 pages of text, an equal number of figures, and 26 plates. Most of the latter are well-selected small portions of topographic maps of the U. S. Geological Survey, reproduced in colors, and illustrating land forms. About 30 pages are devoted to earth relations, over 450 to physiography of the lands, 200 to the atmosphere, and about 50 to the ocean. There is more emphasis on processes than on forms. Henry Holt & Co., New York, $3.50.

CHISHOLM'S HANDBOOK OF COMMERCIAL GEOGRAPHY. There have been many editions of this English treatise on applied geography by G. G. Chisholm so that long use has established its authority as a commercial geography, and frequent revision has kept it up to date. There are over 600 pages of text, and a well selected series of maps showing distribution of resources, density of population, railways, and cities, besides may diagrams, etc. There is a general introduction of about 60 pages, 100 pages are devoted to the discussion of commodities dependent directly or indirectly on climate; fisheries have 5 pages; mineral products 20; manufactured articles 18. The remainder of the book, besides the appendixes, and constituting the larger part of it, is devoted to the commercial geography of the countries of the several continents. Longmans, Green & Co., London, New York, and Bombay, $4.80. L. M.

COMMERCIAL PERU

The Republic of Peru has an area of 438,000 square miles, or more than that of all the states of the United States bordering on the Atlantic, with Vermont, Pennsylvania, and Ohio added. It is essentially a maritime country; its coast line of 1300 miles being about equal to the distance from Boston to Key West, Florida. The population is about 5,000,000, or about the same as that of Ohio. Of these inhabitants about one-tenth are native Indians and descendants of the Incas.

Peru is divided into three well defined zones—the coast region, the Andean range, and the forest region. From a commercial standpoint the coast region is the most important. It is composed of fertile valleys separated by arid plains. The principal industries of this region are the growing of sugar and cotton and the raising of cattle. The Andean region, from the days of the Incas, has been famous for its wealth of minerals, especially silver. The forest region is the richest part of Peru and takes up about two-thirds of the area of the Republic. It has large quantities of gold, silver, copper, tin, mercury, lead, and coal, and immense tropical forests in the head waters of the Amazon. Here rubber trees grow and coca and coffee flourish.

For the year 1908, the exports were valued at $29,200,000, and the imports at $29,700,000, a slight increase over the previous year. Sixty-five per cent of the imports came from the United Kingdom, United States, and Germany; and seventy per cent of the exports were sent to these countries. The exports consisted principally of cotton, rubber, sugar, wool, silver, copper, guano, and chemicals; the imports were manufactured articles and foodstuffs. Of the exports, minerals and metals make up nearly thirty-six per cent. of the total value.

Peru is, without doubt, one of the most richly endowed countries of South America. None of its natural resources are developed to any great extent; much of its soil is of almost unexampled fertility; its undeveloped coal fields are extensive; its oil field is said to be one of the most promising in the world. The cotton is of special class and commands high prices, as the demand is greater than the supply. The working of the guano deposits is an important industry.

Lima, the capital, (pop. 40,000) is connected by rail and tramway with its port, Callao. Iquitos, on the Amazon, the center of the rubber trade is reached by ocean vessels after a journey of 3500 miles up the river from the Atlantic.—(Abstracted from Feb. *Commercial America.)*

NOTE.—A most valuable paper by Dr. Lucy L. W. Wilson, on "Climate and Man in Peru," appeared in the Bulletin of the Geographical Society of Philadelphia, Vol. VIII, pp. 79–97 and 153–171.—*Editors.*

SOME CLIMATIC "WHY'S"

1. Why may there be perpetual snow on mountain tops in the torrid zone?
2. Why does the land warm and cool faster than the sea?
3. Why is an oceanic climate milder than a continental?
4. Why is North Western Europe milder than Labrador?
5. Why are there winds? Why are they such important factors in climate?
6. Why is there a belt of equatorial calms? Why is it rainy?
7. Why do wind belts migrate north and south?
8. Why is the equatorial calm belt prevailingly north of the equator?
9. Why do the trade winds blow from the Northeast and Southeast?
10. Why do the trade winds bring deserts to Africa and jungles to South America?
11. Why are there belts of tropical calms? (horse latitudes.)
12. Why are the horse latitudes dry? Where are they?
13. Why are there alternate land and sea breezes on coasts?
14. Why and how are monsoons produced? Where best developed?
15. Why are monsoons alternately wet and dry?
16. Why is so much of western North America arid ?
17. Why is the desert east of the Andes in Patagonia and west in northern Chile?
18. Why is so much of Central Asia arid? of Australia?
19. Why does our Pacific coast have more rain in winter than in summer?
20. Why are the frigid zones so cold? Why not warm in July?
21. Why will wheat mature more rapidly in Canada than in Kansas?
22. Why does western Washington have such heavy rainfall?
23. Why do Dakota and Kansas have rain chiefly in summer? Result?
24. Why is the weather of our Central States so variable?
25. Why are these states not arid, being east of high mountains?
26. Why is the hottest part of the day not at noon? When is it?
27. Why is our warmest weather not on or about June 21? When is it?
28. Why can Mexico or Ecuador raise the crops of all latitudes?
29. Why can Italy, in latitude of Pennsylvania, raise subtropical fruits?
30. Why is the rainfall of northeast India so very heavy? How heavy?
31. Why are North Sea ports free from ice when Baltic ports are frozen?
32. Why is fruit-growing more extensive in the region of the Great Lakes than in other parts of our northern states?
33. Why are tropical peoples less progressive than those of a temperate climate?
34. Why are there no deserts in Europe? Is this true of any other continent?
35. Why is the climate of oceanic islands rather uniform throughout the year?

R. H. W.

BOOK NOTICES

THE TOLL OF THE ARCTIC SEAS. By Deltus M. Edwards. 449 pp. One large map showing in colors the routes of the chief Arctic expeditions, and about 60 illustrations. Henry Holt and Co., 1910. $2.50 net.

The author says in his preface: "Many of the most powerful stories of the (Arctic) region have never been told outside of official courts of inquiry and records of the navy archives, and it is the purpose of this volume to assemble these naratives, shorn of their scientific verbiage, yet historically accurate."

Each one of the seventeen chapters is devoted to the adventures and achievements of a single Arctic explorer, beginning with Barents and ending with Peary. In chapter XVIII "other expeditions" are briefly described. There is a comprehensive bibliography and an excellent index. Several chapters contain thrilling accounts told in the language of explorers themselves.

ELEMENTS OF GEOLOGY. By Eliot Blackwelder, Associate Professor of Geology, University of Wisconsin, and Harlan H. Barrows, Associate Professor of General Geology and Geography, University of Chicago. 467 pp., 16 plates in colors (contour maps), and 485 other illustrations. American Book Co., 1911. $1.40.

The authors say they have sought to give the student (1) an understanding of the general principles and processes of the science, (2) a few of the fundamental facts, (3) an interest in the subject, and especially (4) training in clear thinking. In their effort "to make the text explanatory rather than merely descriptive," they have been highly successful. The illustrations do more than illustrate: they teach. This is notably true of the diagrams and block drawings. The questions at the end of each chapter are exceptionally good; they call for good thinking. Eight chapters, three-fifths of the book, deal with Physical Geology; the remainder is devoted to Historical Geology, not a bad balance, yet fully enough is given to the latter division of the subject. The book will serve admirably for a year's study late in the high school or for a half year in Normal school or college.

FIELD LESSONS IN THE GEOGRAPHY AND HISTORY OF THE BOSTON BASIN. By Everett L. Getchell. 186 pp. Little, Brown and Co., Boston, 1910. $.60 net.

This little book, filled with suggestions and interesting material is most welcome. Geography teachers in other large cities will do well to consider the preparation of similar volumes for use in their own cities. Home Geography will mean something when the teachers of Philadelphia,

Minneapolis and a hundred other cities have a manual as well worked for their use as Boston teachers now have. The Journal of Geography hopes that many other books of this type may follow.

A CORRECTION. In printing Professor E. V. Robinson's contribution to the Symposium on Commercial Geography in the February issue, a mistake was made in one of the paragraphs. We reprint this in corrected form and also the preceding paragraph in order that the connection may be clear:

All industries involve the use of land, labor, and capital in the form of tools or machinery. The localization of industries is consequently subject to three sets of controls: the natural, originating in the land or physical environment; the human, originating in men; and the economic, originating in capital goods and economic forces.

The natural control, however, underlies and conditions both the others; consequently the logical method of treatment is by regions, which brings to light differences in the natural endowments of different parts of the world, rather than by commodities. Only by thus advancing from the relatively simple and concrete problems presented by definite regions, to the complex generalizations involved in the study of the great world industries, can the student be trained to think consecutively.

AN ACKNOWLEDGMENT. The editors of the JOURNAL wish to express their appreciation of the excellent work done by Professor Wm. M. Gregory and his Ohio colleagues in the March number. We feel that the Ohio number was distinctly a credit to the Ohio men who produced it, an aid to the Ohio teachers who received it, a pleasure to all subscribers, and a help to the management of the magazine. An extra edition of the March number had to be printed to supply the demand for additional copies.

AN ANNOUNCEMENT. We are pleased to announce that the June number will be a special CALIFORNIA-N. E. A. NUMBER. Professor James F. Chamberlain of the Los Angeles Normal School will have the editorial management. Teachers who contemplate visiting California during the coming summer will be especially interested in the June magazine.

A MAP EXERCISE

In an earlier number of the Journal (September, 1910) emphasis was laid upon the educational value of map studies. It is, of course, important that the maps be good ones. Two laboratory map-exercises have already been published, one on North America (Sept.) and one on Physical Conditions and Human Responses in Europe (Dec.). Both of these exercises have been used in various classes in the University of Wisconsin and the results confirm our earlier confidence in the value of such exercises. The wall map is hung in the laboratory; students are given the question sheets and, in some cases, are allowed to work out the exercise in their own time, in others, they work it out during a regular laboratory period. Sometimes the answers to the questions are written out, sometimes simply prepared for an oral recitation. In either case a quiz and class discussion concludes the study of the map.

The following exercise aims to bring out some of

THE RELATIONS OF CLIMATE TO HUMAN ACTIVITIES IN EUROPE.

(Based upon Rand McNally and Co.'s Physical Map of Europe)

1. What are isotherms? Why do they not coincide with the parallels of latitude?

2. What isotherms are shown on the map? Suggest a reason why these particular ones are shown.

3. Explain clearly what you understand to be the meaning of the line marked "Isotherm for January 30°:" of the line marked "Isotherm for July 60°:" of the lines marked respectively "Northern limit of the Vine," "Northern limit of Cereals."

4. Note where the last mentioned line crosses Europe. At about what latitude? If this line is correctly drawn, can cereals be raised in Europe in the N. Frigid zone? About how far north in N. America are cereals grown?

5. What cities of Europe are in about the same latitude as New York or Chicago (see in left hand border of map)? Note that Winnipeg is considerably further south than London or Berlin, and that Christiania and St. Petersburg are as far north as the southern end of Greenland.

6. It is a significant fact that the progressive nations of Europe occupy in large part, a latitude which, in other continents, is avoided because of cold. Discuss the cause and some of the effects of this mild northern climate of Europe.

7. How does the mid-winter temperature of southern Iceland compare with that of, say, Crimea? What is the difference in latitude? Explain cause.

8. Compare the mid-summer temperature of Liverpool and Archangel.

9. Oranges and lemons grow in Spain and Italy. What fruits grow in the corresponding latitude in the United States? In what latitude do oranges grow in the United States? Account for the difference.

10. The North Sea ports are ice-free throughout the year, but the Baltic ports in the same latitude are ice-bound in winter. Explain cause and results.

11. North Germany and South Germany have about the same mean annual temperature regardless of difference in latitude. Account for it.

12. Summarize the reasons for the mild climate of Europe as compared with other lands in the same latitude; consider the effect of this climate upon the general development of Europe.

R. H. W.